

# Innovation in Primary Healthcare

## can it improve health sector productivity and health outcomes?

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### Abstract

Health systems everywhere are facing significant challenges – demand pressures from an ageing population, a rise in chronic health conditions, and greater community expectations as more new health treatments are developed. There are three possible responses to this: increasing health funding (increasing inputs), rationing health services (restricting outputs) or increasing productivity through innovation (doing things differently and more efficiently). This article looks at innovation in New Zealand’s primary healthcare sector and recent attempts to measure its impact across the health system.

**Keywords** innovation, primary healthcare, diffusion, productivity, models of Healthcare, health system impacts

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The performance of primary healthcare is important to the whole health system. Primary healthcare is defined as ‘the professional healthcare provided in the community, usually from a general practitioner (GP), practice nurse, nurse practitioner, pharmacist or other health professional working within a general practice’ (Ministry of Health, 2018).

Primary healthcare is not the place where most health spending occurs; in fact it receives a relatively small proportion of overall health spending. However, more accessible and comprehensive primary healthcare has long been thought of as leading to better population health status at lower cost (for example, as reported by Mays and Blick in 2008). More recent international evidence implies a more nuanced picture: managing cost increases, rather than reducing costs. Kringos et al. (2013) suggest that although strong

primary healthcare is associated with better population health outcomes, lower rates of potentially avoidable hospitalisations and a reduced rate of growth in healthcare spending, it is also associated with higher levels of healthcare spending overall. Other commentators continue to hold that primary healthcare is well positioned to manage down costs and improve health outcomes across the whole health system. Knopf writes: ‘The current expectation is that significant cost savings (change in the slope of the sector’s cost curve) will be made by focussing on increasing and improving services outside the hospital’ (Knopf, 2017, p.28). Kringos et al. recommend further research to ‘explore the relationship between the strength of primary care and overall healthcare spending’ (p.692).

The reason primary healthcare is such a focus for managing costs and improving outcomes across the whole health system is twofold. First, early intervention or prevention has potential to reduce demand for more expensive (often specialist and/or hospital-based) services, by treating the right people in the right place. Second, primary healthcare’s position in the health system makes it well placed to improve the coordination of health services, especially those required to manage chronic health conditions.

**Innovation in healthcare, and its role in improving productivity**

Significant and sustained productivity gains can be made through process innovations that change how services are delivered. In a survey of empirical studies, ‘innovative activity’ has been found to increase an individual firm’s ability to derive revenue from its inputs (Hall, 2011). However, it is noted that while innovative activity might be relatively easy to define, it is notoriously difficult to measure. Having said that, ‘measuring diffusion in the state sector is often relatively straightforward [compared to the private sector] given the greater ability to directly observe activities or outputs’ (Nolan, 2018). For example, it is possible to use diagnosis and procedure codes contained in public hospital event records to see if there have been changes in the way people with certain conditions are treated over time.

**Table 1: Models of innovation in primary healthcare**

Innovation in the delivery of primary healthcare	Example
An open access model	Nirvana Health (the primary care provider contracted to Total Healthcare PHO) operates a model involving low fees, walk-in visits and accessible hours in its 35 VLCA practices (as mentioned above, low fees in exchange for higher capitation payments are a feature of VLCA practices). Nirvana Health and its subsidiaries are for-profit businesses, and this service delivery model (or model of care) is most often associated with a corporate ownership model.
An acute demand management system	Canterbury DHB provides resources for primary healthcare to do ‘whatever it takes’ to provide services in the community for individuals ‘who might otherwise visit the emergency department or be admitted to hospital’, backed up by comprehensive IT support.
A multi-disciplinary team-based model/practice transformation	Health Care Homes (HCH) better manages the mix of acute, routine and preventive treatments by changing the input mix (e.g. staff time, practitioner tools and business activities) to ensure the right mix of staff to focus more on proactive and preventive care and on patients with more complex needs. This is combined with ‘lean’ business processes against a set of standards and criteria that was developed by the HCH Collaborative network in 2016. Practices which use this service delivery model of care can have different ownership models (e.g. community ownership or GP ownership)

Source: adapted from Downs, 2017

Innovation in healthcare has been characterised as the ‘introduction of a new concept, idea, service, process, or product aimed at improving treatment, diagnosis, education, outreach, prevention and research, and with the long term goals of improving quality, safety, outcomes, efficiency and costs’ (Omachonu and Einspruch, 2010, p.5). The Productivity Commission has sought to understand innovative activity in primary healthcare in New Zealand. This has involved looking at whether the authorising environment is conducive to innovation, what innovations (particularly new service models) have emerged, whether and how new service models have diffused across the sector, and what impact they may have had on improving outcomes, efficiency and costs. The next sections describe what the commission has found.

**The policy environment appears to have been conducive to innovation**  
The adoption of the Primary Health Care

Strategy in 2001 signalled a shift to a new way of working. The Primary Health Care Strategy organised services around the needs of an enrolled population and required community involvement in governance and decision making, which allowed more flexibility in the range of services provided.

Not-for-profit ‘primary health organisations’ (PHOs) were set up as the local delivery structures under the Primary Health Care Strategy. Funded by government through district health boards (DHBs), they are required to provide a set of essential primary healthcare services to an enrolled population. This entailed a shift in government funding from fee-for-service payments (per patient per consultation) to capitation funding (a flat rate per head of enrolled population, weighted by age and gender). Patient co-payments (the fee that patients pay each time they use a medical service) still exist, but the strategy restricted the level of fees that health practitioners could charge as

co-payments. ‘Very low cost access’ (VLCA) practices, in high-needs locations, receive higher capitation payments than other practices in exchange for having their co-payments (or fees) capped at a lower rate.

The Primary Health Care Strategy has encouraged the development of several different models of care, and a range of service innovations, such as online and telephone services, integrated or team-based work, new and expanded health workforce roles, coaching and self-management, group consultations, and changes to business organisation and processes.

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Downs (2017, pp.46–50) identified three distinct ‘models of innovation’ in primary healthcare: an open access model such as that used by Nirvana Health; an acute demand management system, such as that operated by Canterbury DHB; and a multi-disciplinary team model known as Health Care Homes (HCH) (see Table 1). Each of these is substantially different from the traditional general practitioner model (usually owned by one or more GPs).

Taking these three models, the drivers of innovation appear to be quite different. The acute demand management model seems to have been driven by pressure on hospital services, while the HCH model is also attractive in areas where there is a shortage of primary care doctors and/or growing demand from the enrolled population.

With respect to the authorising environment, Middleton et al. in research conducted for the commission concluded that the ‘stable structure of the New Zealand Health system ... DHBs [being] in place since 2001 and the current

configuration of PHOs ... since around 2012 ... provided supportive conditions for innovation to emerge from the middle of the system’ (Middleton et al., 2018, p.44). This is not a driver of innovation per se, but an absence of a barrier. Middleton et al. also found that PHOs were facilitators of innovation, sometimes acting alone and sometimes working with DHBs.

### **Overall, diffusion is unclear but barriers to innovation remain**

The commission spoke with several health sector leaders, as part of its inquiry into state sector productivity, and the general

view was that there is a lot of innovation in primary healthcare but that the diffusion or spread of specific innovations is unknown and likely quite uneven.

All the stakeholders the commission met pointed to examples of innovation in primary healthcare that they knew of, but they voiced a range of views about the diffusion of innovation. Many stakeholders felt that the diffusion of innovation was poor. Other stakeholders felt that diffusion was initially slow (after the implementation of the Primary Health Care Strategy) but had increased. This view was supported by Middleton et al.’s comment that ‘injections of funding support at key stages have supported incremental progress towards new models of care’ (Middleton et al., 2018, p.4). Still other stakeholders felt that diffusion could be hidden as it is often locally driven, and local leaders may prefer to describe what they are doing in ways that will differentiate their services. Downs also noted that ‘innovative changes to primary care delivery appear not to be driven by government per se. Rather, most initiatives are driven by local

leaders who are inspired to change the way care is delivered’ (Downs, 2017, p.43).

Middleton et al. also identified barriers to innovation. Persistence with ‘fee-for-service’ patient co-payments was considered to be a barrier: they noted that ‘practices that rely on patient co-payments have continuing incentives to maintain patient volumes in traditional face-to-face interactions’ (p.4). One stakeholder told the commission ‘co-payments kill innovation’. This would suggest that innovations involving a shift away from face-to-face interactions should be easier to implement in VLCA practices, for they receive a higher proportion of their funding from capitation than from fees. However, the cap on fees raises the issue of the adequacy of the capitation payments. Regrettably, some practices with high numbers of patients from very deprived neighbourhoods (including VLCA, and not for profit practices) report that they are struggling financially.

In addition, there are continuing funding (and pricing) issues to be resolved for new service innovations such as telephone triage and online consultations, as these innovations currently risk cutting some general practice funding streams.

Conversely, the injections of funding support identified by Middleton et al. (2018) may have supported progress toward new models of care, although the evidence for this is less certain.

### *The Health Care Home model: a process innovation in primary healthcare*

The Health Care Home model was adapted by Pinnacle Midlands Health Network PHO, from a model used by Group Health in the United States. It first began operating in three practices in Hamilton in 2011 and it is now being implemented in more than 128 general practices across New Zealand (Ernst & Young, 2017, p.9). Although that seems like a fairly rapid rate of expansion, the first three or four years saw the establishment of relatively few new HCH practices, and most of this expansion has occurred after the New Zealand Health Care Home Collaborative was established in 2016. Since then, expansion of the model has been quite rapid.

Cain and Mittman (2002) present ten critical dynamics of innovation in

healthcare: relative advantage; trialability; observability; communication channels; groups with similar characteristics; the pace of innovation and reinvention; cultural and social norms; opinion leaders; compatibility with existing technologies; and dependence on related infrastructure. Middleton et al. use a different model of innovation, but they also argue that HCH

appears to include several of the attributes of innovations that are known to increase the likelihood of adoption, for example, the ... ability to customise the model to a local area (the potential for reinvention), the observability and relative advantage of being an HCH, and the way it can be broken down into manageable parts and implemented incrementally. (Middleton et al., 2018, p.42)

#### **Does HCH, as an example of a primary care innovation, make a difference?**

The commission wanted to know whether the change in the input mix – specifically, the number of doctor and nurse face-to-face consultations and telephone consultations and triage – resulted in more efficient use of general practice resources, and how the change in input mix affected patient experiences with primary care. Additionally, the commission was interested in the impact of a primary care innovation on secondary care: for example, the impact on emergency department (ED) presentations, acute admissions, the length of stay in hospital, ambulatory sensitive hospital admissions or readmissions. Significant differences in these variables could indicate an improvement in resource use/productivity of the health system overall and an improvement in patient outcomes from avoided hospital care.

Detailed analysis of data from the implementation of HCH in 11 general practices – members of Compass Health PHO in the greater Wellington region – was conducted for the Productivity Commission by researchers at AUT (Dasgupta and Pacheco, 2018). The data covered 342,136 individuals registered in 58 Compass Health practices (HCH and non-HCH practices) and was matched

with data on the same individuals from Capital and Coast District Health Board.

The researchers developed four empirical models, ranging from a baseline regression model to more detailed models that controlled for socio-demographic factors (age, sex, ethnicity, New Zealand deprivation quintile), practice-specific time trends, and anticipatory and post-intervention effects. These models did not take into account that HCH practices vary in their levels of ‘maturity’ (measured by a maturity matrix that assesses each practice’s level of adherence to the core model on a scale of 1–4 across four domains and a number of service elements and characteristics). But they did allow for the comparison of practices whose enrolled

care. The researchers found that the implementation of HCH resulted in a drop in the likelihood of an individual experiencing an ED event by 0.1 percentage points per practice quarter. This is statistically significant at the 5% level (Dasgupta and Pacheco, 2018). However, there were no significant impacts on any of the other hospital-related events (acute admissions, the length of stay in hospital, ambulatory sensitive hospital admissions or readmissions).

It is worth noting here that for some practices the post-implementation period has been quite short. Of the 11 Compass Health HCH practices for which data was extracted, five had been working with the HCH model for either 18 or 15 months,

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patient populations have statistically similar characteristics. (It is important to compare statistically similar populations, as comparing HCH practices against the mean of all practices risks creating misleading results, either positive or negative.)

Next, a difference-in-difference analysis was applied across each of the four models, and a supplemental analysis matched these results with a propensity score.

There was insufficient data at the practice level to answer the first question about the nature/extent and impact of the change in input mix. The addition of other practice level data (e.g. wait times, patient/staff ratios, staff turnover, patient experience, numbers of telephone consultations, phone call abandonment rates etc.) would have enabled a deeper analysis of the productivity of general practices.

The data did enable an assessment of the impact of HCH practices on secondary

two had been using it for six months, and four had been using the model for three months only. Therefore, although the analysis looked at hospital-related events and practice activity pre and post the implementation date, regardless of when that date was, a longer-term study using more data would be needed to identify any longer-term impacts of the HCH model.

#### **Further research and evaluation is possible, and necessary**

Few of the innovations described above (the use of the HCH model in different DHBs and PHOs, other innovations used in different practices, PHOs and DHBs, or the Primary Health Care Strategy itself) have had recent, comprehensive evaluations, and some have had none. Downs noted that ‘the three models described in [her] report all hold promise but need much more rigorous evaluation’ (Downs, 2017, p.52). She also noted that a system-wide evaluation of the Primary Health Care

Strategy had not occurred since Victoria University of Wellington and CBG Health Research evaluated its results between 2003 and 2010, and she felt that this was an important gap. This gap may be in the process of being filled, as the commission has heard that the Ministry of Health and the Health Research Council have now jointly funded research to take an in-depth look at new models of primary healthcare, and the Health Services Research Centre has won a five-year programme grant to look more broadly at progress in primary healthcare.

In addition, an evaluation (and follow-up evaluation) of the Pinnacle Midlands Health Network HCH practices in their DHBs (Waikato, Bay of Plenty and Lakes) between 2011 and 2016 was completed by Ernst & Young (Ernst & Young, 2017, 2018). This study used a matched open cohort and multiple logistic modelling, and it suggested that the HCH model has enabled general practices to treat more patients and is associated with significantly lower ambulatory sensitive hospitalisations and presentations to ED services than in non-HCH practices.

The research conducted for the commission (Middleton et al., 2018; Dasgupta and Pacheco, 2018) is intended to add to the existing body of knowledge. One study contributes by describing the recent environment of primary healthcare in New Zealand and identifying barriers to and enablers of innovation and its diffusion, while the other contributes an empirical analysis of the short-term impact of the HCH model on a range of health-related events in secondary care.

In commissioning the AUT research, the commission found that there is enough data to analyse activity in primary healthcare in the Wellington region (and likely in other regions as well) and that it is possible to use administrative data while also preserving patient privacy and confidentiality. The real issue is to develop relationships and establish trust that data will be kept confidential and used for research purposes.

In addition, the difference-in-difference analysis undertaken by the AUT researchers provides a rigorous methodology for statistically similar practices to be compared with each other, to assess the

impact of an innovation in primary healthcare. This methodology could be reused to update this research, and to include a wider range of factors and a longer time frame, when more data becomes available.

### Conclusion

The demand pressures on the health sector are real, and innovative new models of primary healthcare offer opportunities to address them. The work undertaken for the commission should be seen as a starting point for a deeper exploration of the motivations for, barriers to and enablers of innovation in primary healthcare. Further, the impact of innovation can be measured using standard empirical techniques and routinely collected data if the relationships can be built to enable its use.

There is still more work to be done, but there is some evidence that innovation in primary healthcare delivery has the potential to drive both productivity improvement and better outcomes across the wider health system.

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